

# PATENT ABSTRACTS OF JAPAN

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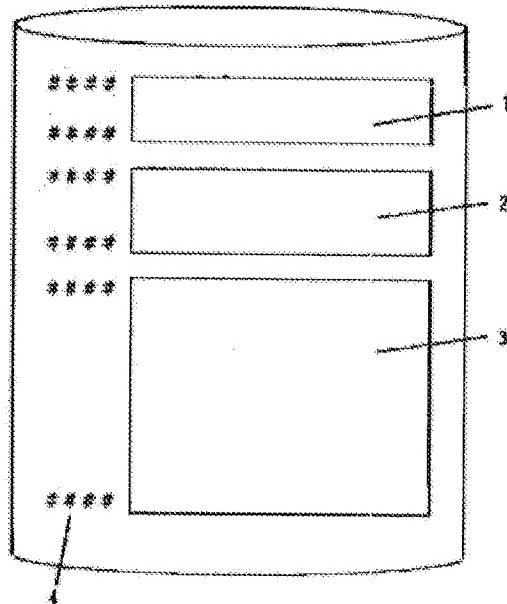
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## (54) GENE INFORMATION RECORDING METHOD

### (57)Abstract:

PROBLEM TO BE SOLVED: To provide a gene information recording method accumulating gene information efficiently to access the whole of the accumulated gene information on an individual.

SOLUTION: A gene information recording file consists of a gene index file 1, a key work index file 2 and a gene information file 3. GENE ID and a recording address of gene information are recorded on the gene index file 1. When gene types are designated by a group, TYPE ID of a gene group is recorded. The key word of a gene is stored in the key word index file 2 and gene sequence information and information on the type of a polymorphic gene group are recorded on the gene information file 3.



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**CLAIMS**

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**[Claim(s)]**

[Claim 1]A gene information record method recording information about two or more individual genes, and recording address information on said recording medium of said information on a recording medium.

[Claim 2]Personal identification information for discriminating said individual from input person identification information inputted when accessing said information is compared, The gene information record method according to claim 1 recording said personal identification information which enables it to access said information on said recording medium when said input person identification information and said personal identification information are in agreement.

[Claim 3]The gene information record method according to claim 1, wherein said information about an individual gene includes base sequence information on DNA.

[Claim 4]The gene information record method according to claim 1, wherein said information about an individual gene includes mold information on gene polymorphism.

[Claim 5]The gene information record method according to claim 1, wherein said recording medium is an IC card.

[Claim 6]The gene information record method according to claim 1, wherein said recording medium is a magnetic disk, an optical disc, or a magneto-optical disc.

[Claim 7]A gene information record method recording an information group characterized by comprising the following.

Gene identification information for identifying two or more individual genes to a recording medium.

Gene information about said gene, keyword information of said gene, and recording address information on said recording medium of said gene information.

[Claim 8]The gene information record method according to claim 7, wherein said information group contains mold identification information of gene polymorphism further in order to identify said gene cluster when said gene contains a gene of a gene cluster of polymorphism. [Claim 9]Personal identification information for discriminating said individual from input person identification information inputted when accessing said information group is compared, The gene information record method according to claim 7 recording said personal identification information which enables it to access said information group on said recording medium when said input person identification information and said personal identification information are in agreement.

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[Translation done.]

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## DETAILED DESCRIPTION

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### [Detailed Description of the Invention]

[0001]

[Field of the Invention]When this invention performs diagnosis of the illness, and a therapy based on gene information, it relates to a method suitable for recording individual gene information cumulatively especially about the record method of required gene information.

[0002]

[Description of the Prior Art]The genetic information which makes representation the DNA sequence information on some living thing kinds including Homo sapiens by progress of the Human Genome Project etc. has been accumulated quickly. Identification of many genes leading to the illness is also progressing by progress of the gene hunt technique represented by positional cloning. It is thought that a break through of the genetic function based on the immense information accumulated will also progress quickly from now on. Now, gene information is collectively stored by various data in CD-ROM distributed from the hard disk in the computer system in organizations which maintain a database and are managed, such as GenBank and DDBJ, or the organization concerned.

[0003]

[Problem to be solved by the invention]The present and the former are showing that the gene is participating in many diseases, such as an adult disease, in a certain form in addition to the illness considered to be a hereditary disease. It is possible that the gene is participating in the grade of progression to the symptom in the infectious disease caused with a virus, bacteria, etc., or the effect of drugs in a certain form. If the information about the genetic function which will be solved from now on is doubled and considered, in diagnosis of the future illness, and a therapy, the information about a gene will be considered to be indispensable. In order to perform exactly diagnosis of the illness to which such a gene relates, and a therapy, the information about an individual gene is indispensable. There is a problem seeing managing the information about an individual's gene intensively from cost aspects, such as maintenance and management, or an ethical field.

[0004]Considering undergoing medical examination in the medical institution which changes with the kinds and stages of a disease, it is desirable for an individual to possess and carry the medium by which each one of gene information was recorded. It is difficult from a cost aspect to, obtain the whole base sequence of each DNA on the other hand to all the information about an individual's gene, for example, a newborn infant, at once. The number of the genes which should be investigated increases gradually as a break through of the network between a genetic function and a gene progresses. The information on the gene which is needed according to the individual illness differs. Then, it is more efficient to accumulate the information on a gene part that it was needed on the occasion of medical examination, and the inspection was undergone, one by one, and to use for future medical examination. By the above, it can carry individually on the occasion of diagnosis of the illness to which a gene relates, and a therapy, and the recording device of the gene information which can be accumulated one by one is required. When it takes into consideration to storing of an individual's whole base sequence, shortening of time to become the immense amount of information over 3 G bytes, and access individual gene information is also big SUBJECT. The individual gene information recorded is highly private, and does not have the contents easily decoded by the 3rd person.

[0005]The purpose of this invention is to provide the gene information record method which can accumulate efficiently the gene information acquired one by one. Other purposes of this invention are to provide the gene information record method which enables high-speed access to the accumulated individual whole gene information. Other purposes of this invention are to provide the gene information record method which enables protection of privacy further again.

[0006]

[Means for solving problem]To achieve the above objects, in this invention, the information about two or more individual genes and the recording address information on the recording medium of this information are recorded on a recording medium. The personal identification information for identifying the input person identification information and the individual who are inputted when accessing the information about an individual gene is compared, When input person identification information and personal identification information are in agreement, the personal identification information which enables it to access the information about an individual gene is recorded on a recording medium.

[0007]The information about an individual gene may include the base sequence information on DNA, and may include the mold information on gene polymorphism. Either an IC card, a magnetic disk, an optical disc or a magneto-optical disc is used as a recording medium.

[0008]The gene identification information for identifying two or more individual genes to a recording medium, if this invention is explained still in detail, The gene information about a gene, the keyword information of said gene, and the recording address information on the recording medium of gene information, It is characterized by recording the information group, \*\* and others, and further, when a gene contains the gene of the gene cluster of polymorphism, this information group contains the mold identification information of gene polymorphism, in order to identify a gene cluster.

[0009]

[Mode for carrying out the invention]The embodiment of this invention is described using drawing 1. Drawing 1 is a figure showing the composition of a gene information recorder file. The gene information recorder file of this example consists of the gene index file 1, the key word index file 2, and the gene information file 3.

[0010]GENE ID which identifies each gene assumed that about 100,000 are in all the genes of human being, and the address with which the gene information of the gene is indicated are recorded on the gene index file 1. By the gene cluster etc. which show polymorphism, TYPE ID which identifies the gene cluster is recorded instead of being GENE ID when it is simpler than to specify each gene individually to carry out mold specification into a group. When overlapping and indicating the information on an individual gene, and the information on a gene cluster, operativity can be improved by recording the information which shows that the gene which corresponding GENE ID and TYPE ID in the gene index file 1 show is the same gene.

[0011]The key word index file 2 is a file which stored keywords, such as a name etc. of the scientific name about GENE ID or TYPE ID, and its gene or gene cluster, a common name, the encoded protein name, or the related illness, etc. By existence of this file, as for an operator, the necessity of memorizing individual GENE ID or TYPE ID becomes nothing possible [ accessing gene information required of the keyword of the form which human being tends to memorize ]. However, this file may exist in the storage of the inside which can be accessed from the application software in the computer system of the side which reads main story recording media, or there, and the exterior.

[0012]The gene information about a gene is stored in the gene information file 3, for example, the gene sequence information about two or more genes and the information about the mold of a polymorphism gene cluster are stored in it. Hereafter, the gene information file 3 is explained.

[0013]Drawing 2 is a figure showing the written example of the gene sequence information on an individual gene. Individual gene information starts with GENE ID5 and is ended by //. GENE ID5 is the ID number or ID code of each gene. Although the one globally more common to the field concerned is desirable, as long as this prepares a conversion table separately, it may be original. In the CHROMOSOME column, the number of 1 to 22 and X, and Y are written in the chromosome in which the gene concerned exists. The more detailed position in each chromosome may be described. DATE shows the time from which the gene information concerned was acquired. METHOD shows the technique of having acquired the DNA sequence information on the gene concerned. FORM shows all the gene information in which the gene information stored contains a control region, an exon, the intron, etc., and the information whether it is partial information only of the exon part where only a control region is important, for example. Although NOTE is not contained in the item of a fixed form, it is a field which records the information considered as it is better to record by a registrant's judgment. POSITION shows the starting point and length of a registration DNA sequence which used standards, such as a transcription initiation site and a translation initiation site, as the base, for example. The DNA sequence of the gene concerned is indicated in SEQUENCE. The above item may be selected if needed and may add other items. Although this example showed the example of the flat file, a description method is not restricted to this.

[0014]Drawing 3 is a figure showing the written example of the information about the mold of a polymorphism gene cluster. An HLA gene group is explained to an example. TYPE ID6 of the upper left end of a table is the identification number or identification signal of the gene cluster concerned. The address of the beginning of this number or a character will be registered into the gene index file 1. The 2nd row shows the name of the individual gene in the HLA gene group which shows gene polymorphism. To the 3rd row, the locus indicated terrorism's information to whether you are a gay for every gene. In this example, by the gay, 1 passes and 0 shows terrorism. The 4th row and the 5th row show the specific mold which the individual concerned has in the polymorphism for every gene. Although the tabular format indicated in this example, the indicating method is not restricted to this. An item may be selected if needed and may add other items.

[0015]What is necessary is to divide the gene index file 1, the key word index file 2, and the gene information file 3 based on the amount of information expected, and just to make it add a postscript from the head of free space at any time beforehand, in order to enable the postscript of the file organization of this example. Or whenever it records, the three above-mentioned sorts of files are recorded from the head of free space, and when adding a postscript, recorded address information may be indicated at the last for the last record of each file this time.

[0016]Although the recording medium of the file in this example has a desirable thing of easily portable capacity and weight, the optimal thing is dependent on the needed size of a gene information file. In recording the whole base sequence of DNA which will be 3 G bytes only for arrangement information, a mass thing like the digital video disc which can be added is needed. Handling is like [ if only the information about a specific gene is indicated / when enough ] an easy IC card. In addition, magnetic disks, such as a floppy disk and a portable hard disk, or a magneto-optical disc can be used if needed.

[0017]Only when the owner of the recording medium concerned recognizes, in order to suppose that it is accessible to a file content, a right password is inputted and it enabled it to open this file. About the contents of the file in a

recording medium, it decided to change each character in a file, a sign, etc. into another character, a sign, etc., and to record them by the function which used the password concerned. Thereby, the decipherment of the file content became impossible without the password.

[0018]Hereafter, the using form of the recording medium of a description is described to this example. Specific genetic screening needed is conducted for a newborn infant or the small child of fixed age. This is realizable by determining the DNA sequence of a subject part or measuring the grade of the hybridization reaction of a DNA probe complementary to the DNA sequence of a subject part based on DNA contained in the leucocytes in a test subject's blood, etc. Registration to the recording medium concerned of the gene information acquired by these inspections is performed in a predetermined medical institution, and access to this storage and registration of the password which makes a decipherment possible are performed by the guardian of a newborn infant or a small child. A guardian should just execute the right to access to a recording medium by proxy until a candidate reaches fixed age. It is needed in the case of a subsequent medical examination or medical examination, and a postscript is added one by one about the newly acquired gene information. When the gene information concerned is needed by the future courses of medical treatment, In the medical institution concerned, the gene information needed is read after the password input by the person in question or a guardian. With reference to the database or the public database of the medical institution possession concerned, the medical examination which suited individual gene information can be undergone by analyzing using a suitable application program.

[0019]As explained above, it became possible to possess and carry in an individual gene information which is needed in the case of diagnosis of an illness relevant to a gene, and a therapy. A suitable medical examination according to individual gene information can be undergone now.

[0020]

[Effect of the Invention]It became possible to accumulate efficiently the gene information acquired one by one by this invention. High-speed access to the accumulated individual whole gene information was attained. Protection of privacy was also attained.

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**DESCRIPTION OF DRAWINGS**

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**[Brief Description of the Drawings]**

[Drawing 1]The figure showing the composition of a gene information recorder file.

[Drawing 2]The figure showing the written example of gene sequence information.

[Drawing 3]The figure showing the written example of the information about the mold of a polymorphism gene cluster.

**[Explanations of letters or numerals]**

1 [ --- The address in a recording medium, 5 / --- GENE ID, 6 / --- TYPE ID. ] --- A gene index file, 2 --- A key word index file, 3 --- A gene information file, 4

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[Translation done.]